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Cold Environment Assessment Tool (CEAT) User's Guide for Apple Mobile Devices

by David Sauter

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14. ABSTRACT
Working in cold environments can adversely impact Soldier effectiveness and result in serious health effects or even death. This technical note describes an easy to use mobile application that can be used to provide guidance to help mitigate these effects.

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cold environment, Soldier effectiveness

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1. Introduction

Beginning in the year 2000, there were an average of over 350 cold weather-related injuries in the US Army every year.[1] The Cold Environment Assessment Tool (CEAT) application (from here on also referred to as the "app") for iOS (Apple mobile operating system) mobile devices (smart phones and tablets) attempts to address this issue by providing guidance regarding cold weather training and missions as a function of air temperature, wind speed, and work intensity. CEAT is based on information found in the "Prevention and Management of Cold-Weather Injuries" Technical Bulletin (TB) Medical 508[2] and the "Field Hygiene and Sanitation" Field Manual (FM) 21-10.[3] Output consists of the computed wind chill temperature,[4] the time until frostbite, and recommended preventive measures.

CEAT was developed for mobile devices to address the issue of adverse impacts due to the cold. Availability on a mobile device ensures that this guidance is readily available at lower echelons and/or remote locations where laptop or desktop computing platforms and/or network connections back to a higher echelon (from which guidance would likely be disseminated) are not available. For a more detailed discussion of mobile Android device relevance to the military see, "Android Smartphone Relevance to Military Weather Applications".[5]

2. CEAT Inputs

To launch CEAT, tap the CEAT icon on the device start screen (Fig. 1). The initial input tab is then displayed for the user to enter the weather and work information (Fig. 2). The temperature and wind values are used in the computation of the wind chill which is required to determine the guidance. The "Work Intensity" element is used to select the appropriate work rate. FM 21-10 defines the 3 work intensity levels as:

- Sedentary: Sentry duty, eating, resting, sleeping, clerical work

- Low: Walking, marching without rucksack, drill and ceremony

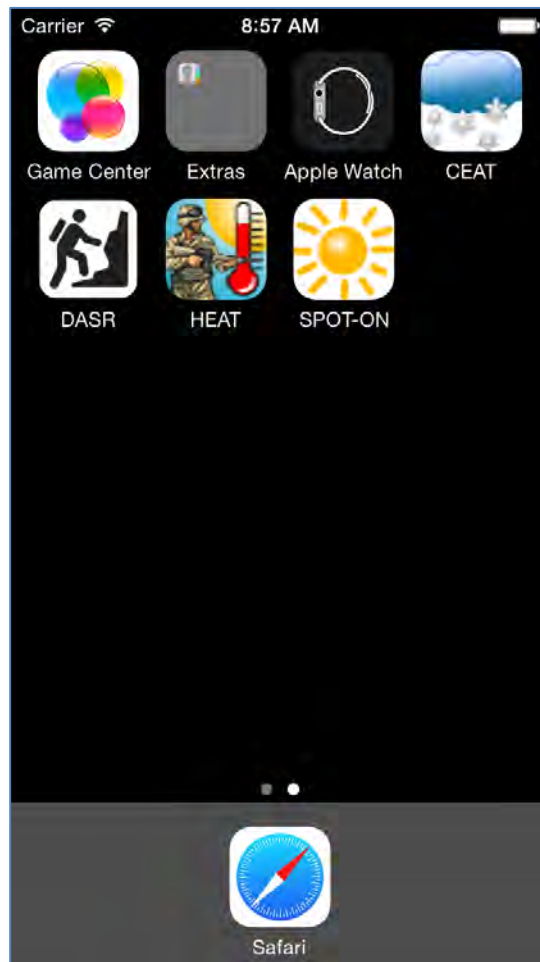- High: Digging foxhole, running, marching with rucksack, making or breaking bivouc

Fig. 1   Launch CEAT

Fig. 2   Input view

3. CEAT Guidance

After any desired edits have been made to the Input view, tapping the "Guidance" tab (represented by the icon of a clipboard at the bottom center of the screen) will result in the "Computed wind chill (deg F)", "Time until Frostbite (minutes)" and "Preventive Measures" information being computed and displayed (Fig. 3). Note that the "Time until Frostbite (minutes)" represents the time "until the occurrence of cheek frostbite in the most susceptible 5 percent of personnel" (per TB MED 508).[3]
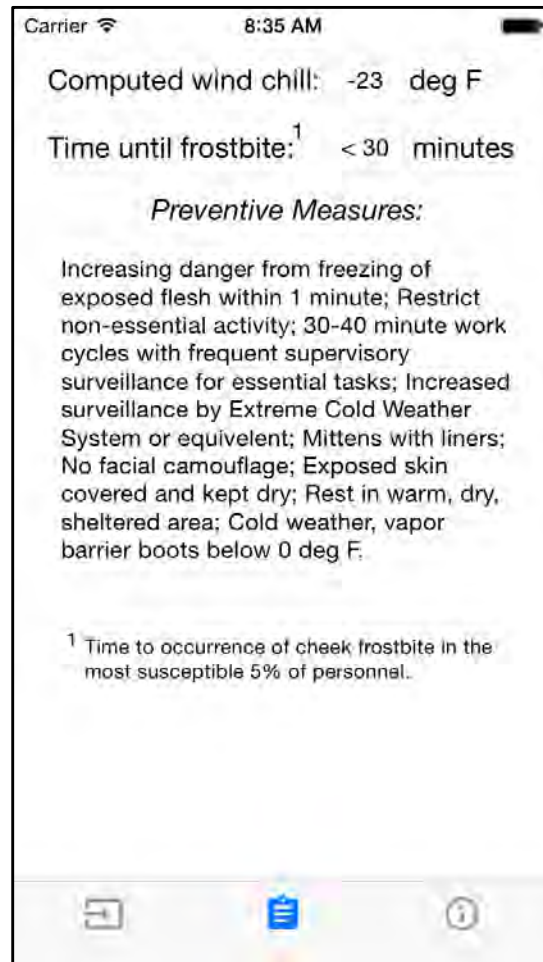
Fig. 3   Guidance view

The last view (Fig. 4), displayed by tapping the icon of an "i" in a circle, and provides the POC information, version and date of the app.

Upon app exit, current values for all of the user inputs will be stored such that they will be the default values displayed when the app is next run.

Fig. 4   Information view

4.   Summary and Conclusions

CEAT provides easy to use and readily understood guidance regarding personnel training or operations in a cold environment. Output is based on information found in an Army field manual and technical bulletin while the wind chill temperature is computed from a National Weather Service formula. Hosting on a mobile device should make it accessible virtually anywhere in a tactical or training environment.

After internal testing and evaluation (2015) the app will be submitted to the Defense Information Systems Agency (DISA) Mobile Application Store (MAS) for validation and with plans for eventual availability to Department of Defense users.

5.   References and Notes

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